

SYSTEM:OS - DIALOG OneSearch

File 2:INSPEC 1969-2002/Nov W3

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File 8:Ei Compendex(R) 1970-2002/Nov W2

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File 144:Pascal 1973-2002/Nov W3

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Set Items Description

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?s (stabilis? or stabiliz? or fix? or pinn?) (5n) (end or ends or edges or edge) and (GMR or spin-valve or spin(w)valve or MRAM or magnetic(3w)memory)

76095 STABILIS?

222814 STABILIZ?

472342 FIX?

43845 PINN?

352542 END

49007 ENDS

77132 EDGES

255844 EDGE

6586 (((STABILIS? OR STABILIZ?) OR FIX?) OR PINN?) (5N) (((END OR ENDS) OR EDGES) OR EDGE)

4135 GMR

20 SPIN-VALVE

370426 SPIN

69844 VALVE

2212 SPIN(W) VALVE

232 MRAM

1139227 MAGNETIC

261824 MEMORY

2562 MAGNETIC(3W)MEMORY

S1 11 (STABILIS? OR STABILIZ? OR FIX? OR PINN?) (5N) (END OR ENDS OR EDGES OR EDGE) AND (GMR OR SPIN-VALVE OR SPIN(W) VALVE OR MRAM OR MAGNETIC(3W)MEMORY)

?rd

...completed examining records

S2 7 RD (unique items)

?t s2/full/all

2/9/1 (Item 1 from file: 2)

DIALOG(R) File 2:INSPEC

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7065455 INSPEC Abstract Number: A2001-22-0755-004, B2001-11-7230-068

Title: Ultra-low hysteresis and self-biasing in GMR sandwich sensor elements

Author(s): Anderson, J.M.; Pohm, A.V.

Author Affiliation: Nonvolatile Electron. Inc., Eden Prairie, MN, USA

Journal: IEEE Transactions on Magnetics Conference Title: IEEE Trans.

Magn. (USA) vol.37, no.4, pt.1 p.1989-91

Publisher: IEEE,

Publication Date: July 2001 Country of Publication: USA

CODEN: IEMGAQ ISSN: 0018-9464

SICI: 0018-9464(200107)37:4:1L.1989:UHSB;1-#

Material Identity Number: I101-2001-011

U.S. Copyright Clearance Center Code: 0018-9464/2001/\$10.00

Conference Title: Eighth Joint Magnetism and Magnetic Materials Intermag Conference

Conference Date: 7-11 Jan. 2001 Conference Location: San Antonio, TX, USA

Document Number: S0018-9464(01)06196-9

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Experimental (X)

**Abstract:** The experiments performed demonstrate that by **pinning** the **edges** in a **GMR** sandwich sensor element a fivefold and greater increase in edge coercivity and a corresponding tenfold decrease in hysteresis can be achieved. The effect is accompanied by self-biasing at submicrometer dimensions. Analysis suggests that the **edge pinning** effect is facilitated by forming a bridge between the magnetic layers of a sandwich that establishes a path for exchange coupling. The energy associated with this exchange increases the field needed to reverse the **edge** magnetizations. This **stabilizes** the magnetizations at the interior of the element as they rotate under an applied field. **Edge pinning** is measured in terms of its "edge spin threshold," or EST, defined as the field at which the characteristic separation in the magnetoresistive transfer curve abruptly closes, signifying complete **edge** reversal. Hard **edge pinned** structures have ESTs greater than the material's ninety-percent saturation field, a test benchmark equal to approximately five times the anisotropy, while soft edge structures have smooth transitions that occur below the ninety-percent saturation field. EST thresholds range from 100 Oe to over 700 Oe depending on the process. For field excursions less than the EST, the material exhibits significantly lower hysteresis. Experimental values of less than 0.5 Oe hysteresis have been recorded for field sweeps of two hundred-fifty Oe (0.2%), compared to about 5.0 Oe observed in soft sandwiches over the same range. A second feature of hard edge devices is self-biasing, which has been demonstrated in devices with sub-micrometer line widths. Biasing at one-half the signal output can be achieved in devices approximately 0.7 micrometers wide and can be adjusted using sense current. These features are valuable for sensor and signal isolator applications by providing an ultra-low hysteresis, bipolar output without the need for power-consuming bias coils. (2 Refs)

Subfile: A B

**Descriptors:** coercive force; giant magnetoresistance; magnetic hysteresis; magnetic multilayers; magnetic sensors; magnetisation reversal; magnetoresistive devices

**Identifiers:** **GMR** sandwich sensor elements; ultralow hysteresis; self-biasing; edge coercivity; **edge pinning** effect; exchange coupling path; edge magnetization reversal; edge spin threshold; magnetoresistive transfer curve; hard **edge pinned** structures; soft edge structures; bipolar output

**Class Codes:** A0755 (Magnetic instruments and techniques); A7570P (Enhanced magnetoresistance in magnetic films and multilayers); A7560E (Magnetization curves, hysteresis, Barkhausen and related effects); B7230 (Sensing devices and transducers); B7310L (Magnetic variables measurement); B3120J (Magneto-acoustic, magnetoresistive, magnetostrictive and magnetostatic wave devices); B3110M (Magnetic multilayers)

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2/9/2 (Item 2 from file: 2)

DIALOG(R)File 2:INSPEC

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5712375 INSPEC Abstract Number: A9722-7570-005, B9711-3110M-005

**Title:** Magnetisation reversal in spin - valve structures

**Author(s):** Goodman, A.M.; O'Grady, K.; Walmsley, N.S.; Parker, M.R.

**Author Affiliation:** Sch. of Electron. Eng., Univ. Coll. of North Wales, Bangor, UK

**Journal:** IEEE Transactions on Magnetics Conference Title: IEEE Trans. Magn. (USA) vol.33, no.5, pt.1 p.2902-4

**Publisher:** IEEE,

**Publication Date:** Sept. 1997 **Country of Publication:** USA

**CODEN:** IEMGAQ **ISSN:** 0018-9464

**SICI:** 0018-9464(199709)33:5:1L.2902:MRSV;1-Q

**Material Identity Number:** I101-97007

**U.S. Copyright Clearance Center Code:** 0018-9464/97/\$10.00

**Conference Title:** 1997 IEEE International Magnetics Conference (INTERMAG '97)

**Conference Sponsor:** Magn. Soc. IEEE

Conference Date: 1-4 April 1997 Conference Location: New Orleans, LA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Applications (A); Practical (P); Experimental (X)

Abstract: Magnetisation reversal has been studied in detail for **spin - valve** structures based on the Ta/NiFeCo/Cu/NiFeCo/FeMn system. The objective of the work is to examine the role of inter and intra-layer coupling in the systems and to this end the thickness of the **pinned** layer was varied so as to examine the effects and the extent of the exchange coupling from the FeMn layer. We find that as the thickness of the pinned layer is decreased the effect of the exchange coupling increases in that the loop of the pinned layer is shifted to higher fields and that the switching region of the loop broadens substantially and the reversal becomes bimodal. (9 Refs)

Subfile: A B

Descriptors: cobalt alloys; copper; exchange interactions (electron); giant magnetoresistance; iron alloys; magnetic heads; magnetic multilayers; magnetic switching; magnetic thin film devices; magnetisation reversal; magnetoresistive devices; manganese alloys; nickel alloys; remanence; tantalum

Identifiers: magnetisation reversal; **spin - valve** structures; intra-layer coupling; inter-layer coupling; pinned layer; exchange coupling; switching region; bimodal reverse; **GMR**; magnetic heads; switching field distribution; Ta-NiFeCo-Cu-NiFeCo-FeMn

Class Codes: A7570F (Magnetic ordering in multilayers); A7550R (Magnetism in interface structures); A7530E (Exchange and superexchange interactions in magnetically ordered materials); A7560E (Magnetization curves, hysteresis, Barkhausen and related effects); B3110M (Magnetic multilayers); B3120B (Magnetic recording); B3120N (Magnetic thin film devices); B3120J (Magneto-acoustic, magnetoresistive, magnetostrictive and magnetostatic wave devices)

Chemical Indexing:

Ta-NiFeCo-Cu-NiFeCo-FeMn int - NiFeCo int - FeMn int - Co int - Cu int - Fe int - Mn int - Ni int - Ta int - NiFeCo ss - Co ss - Fe ss - Ni ss - FeMn bin - Fe bin - Mn bin - Cu el - Ta el (Elements - 1,3,1,3,2,6)

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2/9/3 (Item 3 from file: 2)

DIALOG(R)File 2:INSPEC

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5587897 INSPEC Abstract Number: B9707-3120B-003

**Title: Narrow end-on giant magnetoresistance READ-head sensors**

Author(s): Pohm, A.V.; Beech, R.S.; Anderson, J.M.; Black, W.C.

Author Affiliation: Nonvolatile Electron. Inc., Eden Prairie, MN, USA

Journal: IEEE Transactions on Magnetics vol.33, no.3 p.2392-6

Publisher: IEEE,

Publication Date: May 1997 Country of Publication: USA

CODEN: IEMGAQ ISSN: 0018-9464

SICI: 0018-9464(199705)33:3L:2392:NGMR;1-3

Material Identity Number: I101-97005

U.S. Copyright Clearance Center Code: 0018-9464/97/\$10.00

Document Number: S0018-9464(97)02950-6

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: End-on (vertical) giant magnetoresistance (**GMR**) head sensors can be made with high sensitivity and high permeability by use of the parallel coupling existing in sandwich materials and by having the effective easy axis along, rather than across, the sensor. Sensors with widths ranging from 0.75-2.0  $\mu\text{m}$  and with sense currents of 3-4 mA per  $\mu\text{m}$  yield near linear peak to peak outputs greater than 1 mV in shielded head structures. For stability, the **edge** magnetization must be **pinned**. End-on head sensors are found to be particularly attractive for narrow heads.

(6 Refs)

Subfile: B

Descriptors: giant magnetoresistance; magnetic heads; magnetic sensors; magnetoresistive devices

Identifiers: end-on giant magnetoresistance read head sensor; sensitivity; permeability; parallel coupling; sandwich material; easy axis; vertical head sensor

Class Codes: B3120B (Magnetic recording); B3120J (Magneto-acoustic, magnetoresistive, magnetostrictive and magnetostatic wave devices)

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2/9/4 (Item 4 from file: 2)

DIALOG(R) File 2:INSPEC

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5414764 INSPEC Abstract Number: B9612-3120J-012

Title: **Micromagnetics of spin valve memory cells**

Author(s): Youfeng Zheng; Jian-Gang Zhu

Author Affiliation: Center for Micromagnetics & Inf. Technol., Minnesota Univ., Minneapolis, MN, USA

Journal: IEEE Transactions on Magnetics Conference Title: IEEE Trans. Magn. (USA) vol.32, no.5, pt.1 p.4237-9

Publisher: IEEE,

Publication Date: Sept. 1996 Country of Publication: USA

CODEN: IEMGAQ ISSN: 0018-9464

SICI: 0018-9464(199609)32:5:1L.4237:MSVM;1-U

Material Identity Number: I101-96007

U.S. Copyright Clearance Center Code: 0018-9464/96/\$05.00

Conference Title: 1996 IEEE International Magnetics Conference (INTERMAG '96)

Conference Sponsor: Magn. Soc. IEEE

Conference Date: 9-12 April 1996 Conference Location: Seattle, WA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Theoretical (T)

Abstract: This paper presents a systematic micromagnetic analysis on **spin valve GMR** memory elements. It is found that for submicron size **spin valve** elements, **edge** demagnetization field, arising from the **pinned** layer, results in significant magnetization curling at the end edges of the free layer. This edge demagnetization phenomenon yields significant degradation of device performance. It is proposed that by making the pinned film element slightly longer than the free layer so that the ends of the free and pinned layers are separated, the edge demagnetization in the free layer can be essentially eliminated. (4 Refs)

Subfile: B

Descriptors: demagnetisation; giant magnetoresistance; magnetic film stores; magnetoresistive devices

Identifiers: **spin valve GMR** memory cell; micromagnetic analysis; edge demagnetization field; pinned layer; magnetization curling

Class Codes: B3120J (Magneto-acoustic, magnetoresistive, magnetostrictive and magnetostatic wave devices); B3120N (Magnetic thin film devices)

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2/9/5 (Item 5 from file: 2)

DIALOG(R) File 2:INSPEC

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00988180 INSPEC Abstract Number: C76031596

Title: **Stripe-line coil for magnetic-field generation in bubble memory devices**

Journal: Computer Design vol.15, no.7 p.116

Publication Date: July 1976 Country of Publication: USA

CODEN: CMPDAM ISSN: 0010-4566

Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P)

Abstract: An improved coil for **magnetic bubble memory** devices consists of a stripe-line coil pattern with varying widths of conductor

etched from a conductive film supported on a polyimide film. The multiple-layer stripe-line coil has conductors in series along the layer direction, rather than in the axial direction, which minimises potential differences. The stripe-line layer is wrapped around a fixed coil form, and the outer ends of the conductors are connected electrically as a single loop to form a field coil. Conductor length, width, and spacing are controlled by the etched pattern, resulting in coil parameters, such as size, shape, and the like, with less variation from run to run than in wire-wound coils. The stripe-line coil arrangement is simpler, easier to wind, and has better field uniformity inside the coil and less coil loss at high frequency operation. (0 Refs)

Subfile: C

Descriptors: magnetic bubble devices

Identifiers: polyamide film; fixed coil form; bubble memory devices

Class Codes: C5320E (Storage on stationary magnetic media)

2/9/6 (Item 1 from file: 8)  
DIALOG(R) File 8: Ei Compendex(R)  
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04539284 E.I. No: EIP96100378690

Title: Micromagnetics of spin valve memory cells

Author: Zheng, Youfeng; Zhu, Jian-Gang

Corporate Source: Univ of Minnesota, Minneapolis, MN, USA

Conference Title: Proceedings of the 1996 IEEE International Magnetics Conference (INTERMAG'96). Part 1 (of 3)

Conference Location: Seattle, WA, USA Conference Date: 19960409-19960412

E.I. Conference No.: 45461

Source: IEEE Transactions on Magnetics v 32 n 5 pt 1 Sep 1996. p 4237-4239

Publication Year: 1996

CODEN: IEMGAQ ISSN: 0018-9464

Language: English

Document Type: JA; (Journal Article) Treatment: T; (Theoretical); X; (Experimental)

Journal Announcement: 9612W4

Abstract: This paper presents a systematic micromagnetic analysis on spin valve GMR memory elements. It is found that for submicron size spin valve elements, edge demagnetization field, arising from the pinned layer, results in significant magnetization curling at the end edges of the free layer. This edge demagnetization phenomenon yields significant degradation of device performance. It is proposed that by making the pinned film element slightly longer than the free layer so that the ends of the free and pinned layers are separated, the edge demagnetization in the free layer can be essentially eliminated. (Author abstract) 4 Refs.

Descriptors: \*Random access storage; Magnetic storage; Magnetization; Ferromagnetic materials; Magnetic films; Demagnetization; Computer simulation; Switching; Geometry; Magnetic hysteresis

Identifiers: Spin valve memory cells; Micromagnetics; Ferromagnetic layers

Classification Codes:

722.1 (Data Storage, Equipment & Techniques); 708.4 (Magnetic Materials); 701.2 (Magnetism: Basic Concepts & Phenomena); 723.5 (Computer Applications); 921.4 (Combinatorial Mathematics, Includes Graph Theory, Set Theory)

722 (Computer Hardware); 708 (Electric & Magnetic Materials); 701 (Electricity & Magnetism); 723 (Computer Software); 921 (Applied Mathematics)

72 (COMPUTERS & DATA PROCESSING); 70 (ELECTRICAL ENGINEERING); 92 (ENGINEERING MATHEMATICS)

2/9/7 (Item 1 from file: 144)  
DIALOG(R) File 144:Pascal

*duplicate*

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15615184 PASCAL No.: 02-0319409

**Effects of Stray Fields in Flat-End and Pointed-End NiFe/Cu/NiFe/NiO**

**Wires**

KIMURA Takashi; WAKAYA Fujio; GAMO Kenji

Department of Physical Science, Graduate School of Engineering Science,  
Osaka University, 1-3 Machikaneyama-cho, Toyonaka, Osaka 560-8531, Japan;  
Research Center for Materials Science at Extreme Conditions, Osaka  
University, 1-3 Machikaneyama-cho, Toyonaka, Osaka 560-8531, Japan

Journal: Japanese Journal of Applied Physics, Part I : Regular papers,  
short notes & review papers, (2001) 11, 40 (11) 6357-6359

ISSN: 0021-4922 CODEN: JAPNDE Availability: INIST-9959

Document Type: P (Serial) ; A (Analytic)

Country of Publication: United States

Language: English

The effects of the stray fields induced by pinned layers in two-types of 1-  $\mu$  m-wide NiFe/Cu/NiFe/NiO wires were investigated using the giant magnetoresistance effect and exchange anisotropy. One wire had flat ends and the other had pointed ends. It was found that the switching field of the free layer in the flat-end wire was smaller than that in the pointed-end wire because of the larger demagnetizing and stray fields and that the stray field in the pointed-end wire can be negligible. The stray field estimated from the experimental result in the flat-end wire was consistently explained by the magnetic charges at the wire end in the pinned layer. (c) 2001 The Japan Society of Applied Physics

English Descriptors: Experimental study; Magnetic fields; Magnetic multilayers; **Spin valve** ; Quantum wires; Nanostructured materials; Giant magnetoresistance; Magnetic domains

French Descriptors: 7570C; Etude experimentale; Champ magnetique; Multicouche magnetique; Vanne spin; Fil quantique; Nanomateriau; Magnetoresistance geante; Domaine magnetique

Classification Codes: 001B70E70C

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